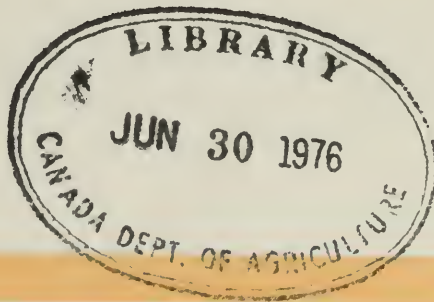




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# Growing Fall Rye for Grain in the Atlantic Provinces

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and Grain in the Atlantic Provinces*.

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## A USEFUL GRAIN CROP


Rye is a useful grain crop for the Atlantic region because it yields well year after year. You can seed it in the fall to avoid problems associated with early spring seeding.

Although rye is less palatable than other cereals to most classes of livestock, proper feeding practices reduce palatability problems: steam pelleting of rye and gradual introduction into the ration help.

### Remember

- Select well-drained fields.
- Prepare a seedbed free from weeds and grass. Plow early and work the land thoroughly.
- Apply adequate fertilizer and lime.
- Use Certified seed of a recommended variety.
- Sow at 125 kg/ha (2 bu/ac), before the deadline in your area.
- Fertilize in early spring with ammonium nitrate.

*Cover photo: Well-filled heads of fall rye*



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# Growing Fall Rye for Grain in the Atlantic Provinces

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Fall rye can be grown profitably in the Atlantic Provinces and production can be substantially increased. It is one of the best-adapted cereals grown in the region. Rye is generally not troubled by winterkill, disease, or—when seeded in the fall—the problems associated with early seeding of spring cereals.

Although rye grows best on deep fertile soils, it does better than most other grain crops on infertile, poorly drained acid soils. Because rye improves light sandy soils by adding organic matter when plowed down, it is used in tobacco rotations in the region.

Fall rye has many uses. In the proper proportion, it can be fed to all livestock although decreased palatability may be a problem. It may be grown for grain, forage, and maintenance of soil organic matter. Good-quality grain can be sold for use in farm feed formulations or in commercial feed formulations. There is also a market for rye in the distilling industry.

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## HOW TO GROW RYE

### Seedbed

Select a well-drained field and plow early, in July if possible. When fall rye follows silage, hay, or pasture, work the land thoroughly and frequently; fall rye after a cereal crop does not require as intensive cultivation. All legumes, weeds, and grasses, especially couch grass, should be killed. Prepare the seedbed carefully to save seed and give the rye a good start.

Rolling after seeding provides a firm, smooth seedbed that produces rapid, even growth and makes harvesting easier.

### Fertilizer

High yields of rye require adequate levels of plant nutrients. Have the soil tested to determine what fertilizer may be needed.

To ensure adequate phosphorus (P) and potassium (K), apply the equivalent of 225–450 kg/ha (200–400 lb/ac) 5-20-20 on high fertility soils and 450–675 kg/ha (400–600 lb/ac) on low fertility soils. Low rates of fertilizer are generally more efficiently utilized when drilled with the seed; any additional amounts in excess of 280 kg/ha (250 lb/ac) 5-20-20 should be broadcast and worked in before seeding.

Also apply 165–330 kg/ha (150–300 lb/ac) of ammonium nitrate as soon as possible after new spring growth begins. Use the higher rate when rye is grown after cereals, corn, or grass and a lower rate if rye follows peas or a heavy legume sod.

### Recommended varieties

All three of the recommended varieties are high yielding and moderately resistant to lodging.

Kustro — Shortest straw, susceptible to winter injury in a year of severe winter-killing, poor resistance to snow mold.

Kodiak — Tall, winter-hardy, good resistance to snow mold.

Puma — Intermediate in height, winter-hardy, fair to good resistance to snow mold.

### Seed

Always use seed of a recommended variety. Certified seed is preferable because it has good germination and is nearly free from ergot and weed seeds. Order your seed early to be sure to have it at seeding time.

If you must use local seed that is not Certified, a germination test will help avoid poor stands; homegrown seed should be cleaned to Certified seed standards. In some areas of the region, rye may not ripen in time to seed in the same year. Because germination drops rapidly in





**Figure 1.** Test plots of rye varieties on November 8 after seeding on September 5. These strong, healthy plants are in good condition for overwintering.

fall rye, you *should* have a germination test on seed carried over for use in the next year. Since rye is cross-pollinated, be sure to prevent natural mixing of varieties: grow only one variety or, if two varieties are grown, locate the seed fields as far apart as possible. Your best guide for seed production is Circular 6-73, *Regulations and procedures for Pedigreed seed crop production*, which can be obtained from the Canadian Seed Growers Association, Box 8455, Ottawa, Ontario.

### **Seeding**

Seed lightly because rye needs plenty of room to stool out. For seed of good quality in recommended varieties, select a seeding rate of 125–150 kg/ha (2–2.5 bu/ac); if using the crop for forage, the heavier rate of seeding is desirable. Sow seed to a depth of 5 cm (2 in.). Rolling after seeding has been beneficial at Nappan.

Rye is best seeded in very late August or early September, depending on climatic conditions in the area. Ask your local Provincial Soils and Crops representative what the optimum seeding date is in your area. After seeding, growth of foliage should reach 10–15 cm (4–6 in.) before fall freeze-up.

### **Weed control**

Cultivate early to eliminate many weeds before seeding in the fall. If annual weeds germinate, winter will eliminate them. The vigorous, early-spring growth of rye will smother many spring-germinating annual weeds. This growth usually keeps winter annual weeds in check. You can also apply herbicides in the fall or spring. Follow the manufacturer's recommendations.

Try to eliminate couch grass (quack grass). It can be a severe competitor with rye, and can also encourage ergot to build up in rye fields. To reduce couch grass infestation in fields plowed from sod in July, cultivate the couch grass each time the shoots reach 7–10 cm (3–4 in.) in height. In cropped fields, remove the crop as early as possible and cultivate several times before planting fall rye.

## Harvesting

All varieties of rye mature at about the same time. In some areas of the region, fall rye is not ready for harvesting much before spring-sown cereals. The straw can be more than 2 m (6 ft) tall. Cut as high as possible when combining to prevent straw from winding on the reel. Do not start combining until the crop is fully ripe unless a grain dryer is used. Because shattering of seed is not generally a problem with fall rye, you can delay harvesting beyond crop maturity without serious grain losses. You may therefore be able to delay—subject to grain losses—until after spring-sown cereals are ready so that your combine can be more efficiently used.

## Diseases

*Ergot* is the most serious disease of rye but it can usually be avoided if you use clean seed and do not grow successive crops on the same field.

Watch for large, hornlike, black ergot bodies growing in place of the kernels. Cultivate, mow, or spray a herbicide around the border of the field to control weeds like couch grass that can host ergot. If you do this, you can restrict ergot mainly to the edge of the field and locations where winterkill has occurred and late heads appear. Avoid these areas at harvest if ergot is severe.

Because ergot is poisonous to man and livestock, only a small amount is permitted in grain for commercial use. When the grain is ripe, some ergot bodies fall to the ground before harvest. A good grain cleaner removes the larger pieces. Small or broken pieces can be removed by soaking the grain in a brine of 18 kg (40 lb) of common salt in 90 litres (20 gal) of water. Skim off the floating ergot, and rinse the grain in clean water and allow it to dry. Gravity machines to remove the ergot from rye have been developed for commercial use.

Clean seed and crop rotation are your best defences against ergot. Proper fertilization and good crop management reduce winterkill and promote uniform growth, which also help reduce ergot. To learn more about ergot, obtain Publication 1438, *Ergot of Grains and Grasses*, from the Information Division, Agriculture Canada, Ottawa, Ontario, K1A 0C7.





**Figure 2. A productive field of fall rye.**

**Figure 3. A mature stand of fall rye.**





Figure 4. Ergot bodies replacing normal kernels in heads of fall rye.

*Leaf rust* sometimes attacks rye planted in July, or earlier, so severely that it reduces pasture yields. Although leaf and stem rust occur on rye, they do not usually affect the grain yield of rye seeded in August or September.

*Mildew* frequently gives a moldy appearance to rye when it is headed out. This is usually not serious.



*Snow mold* can give a moldy, sick appearance to rye in the spring, especially if the crop had excessive growth in the fall. It is most severe after a winter with heavy snow cover and relatively mild soil temperatures. New healthy growth usually replaces the diseased growth when nitrogen is applied in the spring.

Other leaf diseases are rarely troublesome.

## USES

The Atlantic region can use more fall rye, particularly for feed grain and also for erosion prevention, for emergency forage, and for use in the food and beverage industries.

### **Livestock feed**

Many producers overlook rye as a grain in livestock feed but some innovative farmers and research workers are proving its worth in high-energy, grain rations.

Studies at the Research Station at Fredericton showed that dairy cattle do well on a diet of 60% or more rye in the grain mixture. Further studies at the Research Station at Charlottetown showed that rye is equal to barley when fed to steer calves as 60% of the grain mixture.

At the Experimental Farm, Nappan, hogs showed reduced feed intake and growth performance when fed rye with 0.05% and 1.10% ergot. You should, therefore, restrict the level of ergot in rye feed to 0.25%; do not feed rye containing ergot to breeding stock.

Steam pelleting of rye increases feed consumption and rate of gain in hogs and chickens. Farmers are feeding rye up to 50% in starter and grower rations with success. These hogs tend to grow a little slower, to put on a firmer fat, and to be leaner than hogs fed on corn or barley ration. Some mill companies in the region now formulate rations containing rye when sufficient volume and quality are obtained.

### **Erosion control and organic maintenance**

Erosion is a serious problem in many areas of the Atlantic region. Rye can help reduce the loss of soil and nutrients in the winter. If you harvest early, rye can be seeded after such spring crops as cereals, field peas, potatoes, and corn. On a potato or corn crop to be followed by rye, do not use herbicides that leave residues that may harm the rye.

Rye is used in tobacco rotations mainly because the straw adds much-needed organic matter to the soil. You can harvest a crop of rye for grain and still use the straw for organic matter.

### **Pasture, silage, and hay**

Rye can be used for pasture in the Atlantic Provinces. It grows well

in late fall and early spring and is acceptable to livestock. This crop extends the grazing season and conserves barn feed.

Spring grazing can start in mid-May, when plants are 15 cm (6 in.) high. Wait until the land is firm so that livestock do not seriously damage the crop. Grazing can continue through the summer but rotational grazing is necessary. Good recovery takes at least 2 weeks. Fall rye is not generally as productive as permanent pasture. If rye is grazed lightly in the fall or spring, a grain crop of reduced yield can be harvested.

Grass can be seeded with rye in the fall and inoculated legume seed broadcast in early spring. Alternatively, the forage mixture may be seeded with rye if you do it before mid-July. If you seed cereal and forage crops together, do not expect maximum production from each crop. For this reason, the practice is seldom recommended.

Rye makes acceptable silage if cut in the boot or early milk stage. Later, it becomes coarse and unpalatable. Hay is usually of low quality and difficult to cure.

### **Distilling industry**

The distilling industry in the region can use at least 1000 tonnes (40,000 bu) of fall rye. Only about 25% of this is now supplied locally.



# CONVERSION FACTORS FOR METRIC SYSTEM

Imperial units	Approximate conversion factor	Results in:	
LINEAR			
inch	x 25	millimetre	(mm)
foot	x 30	centimetre	(cm)
yard	x 0.9	metre	(m)
mile	x 1.6	kilometre	(km)
AREA			
square inch	x 6.5	square centimetre	(cm <sup>2</sup> )
square foot	x 0.09	square metre	(m <sup>2</sup> )
acre	x 0.40	hectare	(ha)
VOLUME			
cubic inch	x 16	cubic centimetre	(cm <sup>3</sup> )
cubic foot	x 28	cubic decimetre	(dm <sup>3</sup> )
cubic yard	x 0.8	cubic metre	(m <sup>3</sup> )
fluid ounce	x 28	millilitre	(ml)
pint	x 0.57	litre	(ℓ)
quart	x 1.1	litre	(ℓ)
gallon	x 4.5	litre	(ℓ)
bushel	x 0.36	hectolitre	(hl)
WEIGHT			
ounce	x 28	gram	(g)
pound	x 0.45	kilogram	(kg)
short ton (2000 lb)	x 0.9	tonne	(t)
TEMPERATURE			
degrees Fahrenheit	(° F-32) x 0.56 or (° F-32) x 5/9	degrees Celsius	(° C)
PRESSURE			
pounds per square inch	x 6.9	kilopascal	(kPa)
POWER			
horsepower	x 746 x 0.75	watt kilowatt	(W) (kW)
SPEED			
feet per second	x 0.30	metres per second	(m/s)
miles per hour	x 1.6	kilometres per hour	(km/h)
AGRICULTURE			
gallons per acre	x 11.23	litres per hectare	(ℓ/ha)
quarts per acre	x 2.8	litres per hectare	(ℓ/ha)
pints per acre	x 1.4	litres per hectare	(ℓ/ha)
fluid ounces per acre	x 70	millilitres per hectare	(ml/ha)
tons per acre	x 2.24	tonnes per hectare	(t/ha)
pounds per acre	x 1.12	kilograms per hectare	(kg/ha)
ounces per acre	x 70	grams per hectare	(g/ha)
plants per acre	x 2.47	plants per hectare	(plants/ha)



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